

CLAIMS

1. A mold for injection molding a light guide plate which comprises a fixed mold, a moving mold and a cavity portion formed by fitting the fixed mold and the moving mold to each other and is used for forming the light guide plate having a face receiving incident light, a face opposite to the face receiving incident light, a face outputting light, a face reflecting light opposite to the face outputting light and two side faces by injection of a melted resin material for molding into the cavity portion,
- 10 wherein a plurality of pin gates and/or film gates for injecting the melted resin material for molding into the cavity portion are formed in portions corresponding to the side portions of the obtained light guide plate.
- 15 2. A mold for injection molding a light guide plate which comprises a fixed mold, a moving mold and a cavity portion formed by fitting the fixed mold and the moving mold to each other and is used for forming the light guide plate having a face receiving incident light, a face opposite to the face receiving incident light, a face outputting light, a face reflecting light opposite to the face outputting light and two side faces by injection of a melted resin material for molding into the cavity portion,
- 20 wherein a plurality of pin gates and/or film gates for injecting the melted resin material for molding into the cavity portion are formed in portions corresponding to the side portions of the obtained light guide plate, and a room for balancing flow comprising an ear-shaped portion to which the melted resin material for molding is supplied is disposed
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between each gate and a sprue or a runner.

3. A mold for injection molding a light guide plate which comprises a fixed mold, a moving mold and a cavity portion formed by fitting the fixed mold and the moving mold to each other and is used for forming the light guide plate having a face receiving incident light, a face opposite to the face receiving incident light, a face outputting light, a face reflecting light opposite to the face outputting light and two side faces by injection of a melted resin material for molding into the cavity portion,

wherein a plurality of pin gates and/or film gates for injecting the melted resin material for molding into the cavity portion are formed in portions corresponding to the side portions of the obtained light guide plate, a room for balancing flow comprising an ear-shaped portion to which the melted resin material for molding is supplied is disposed between each gate and a sprue or a runner, and an area of each gate is set so that a temperature of the melted resin material for molding introduced into the cavity portion through each gate is higher than a temperature of the melted resin material for molding supplied to each room for balancing flow by at least 5°C due to heat generated from shearing when the melted resin material for molding passes through the gate.

4. A mold for injection molding a light guide plate which comprises a fixed mold, a moving mold and a cavity portion formed by fitting the fixed mold and the moving mold to each other and is used for forming the light guide plate having a face receiving incident light, a face opposite to the face receiving incident light, a face outputting light, a face reflecting light

opposite to the face outputting light and two side faces by injection of a melted resin material for molding into the cavity portion,

wherein a plurality of pin gates for injecting the melted resin material for molding into the cavity portion are formed in portions corresponding to the side portions of the obtained light guide plate, a room for balancing flow comprising an ear-shaped portion to which the melted resin material for molding is supplied is disposed between each pin gate and a sprue or a runner, and each area S (mm^2) of the plurality of pin gates satisfies a relation expressed by equation [1]:

$$1.0 \times 10^{-7} \times A \times (L/n) \leq S \leq 1.0 \times 10^{-3} \times A \times (L/n) \quad \dots [1]$$

when an area of the side face of the obtained light guide plate is represented by A (mm^2), a length of a longer edge of the face receiving incident light is represented by L (mm), and a number of the pin gate is represented by n .

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5. A mold for injection molding a light guide plate which comprises a fixed mold, a moving mold and a cavity portion formed by fitting the fixed mold and the moving mold to each other and is used for forming the light guide plate having a face receiving incident light, a face opposite to the face receiving incident light, a face outputting light, a face reflecting light opposite to the face outputting light and two side faces by injection of a melted resin material for molding into the cavity portion,

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wherein a plurality of film gates for injecting the melted resin material for molding into the cavity portion are formed in portions corresponding to the side portions of the obtained light guide plate, a room for balancing flow comprising an ear-shaped portion to which the melted

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resin material for molding is supplied is disposed between each film gate and a sprue or a runner, and each area S' (mm^2) of the plurality of film gates satisfies a relation expressed by equation [2]:

$$1.0 \times 10^{-5} \times A \times (L/n) \leq S' \leq 1.0 \times 10^{-2} \times A \times (L/n) \quad \dots [2]$$

5 when an area of the side face of the obtained light guide plate is represented by A (mm^2), a length of a longer edge of the face receiving incident light is represented by L (mm), and a number of the film gate is represented by n .

10 6. The mold for injection molding a light guide plate according to any one of Claims 1 to 5, wherein a same number, which is 1 or greater, of pin gates and/or film gates are formed at both side portions corresponding to the side faces of the obtained light guide plate.

15 7. The mold for injection molding a light guide plate according to Claim 6, wherein a same number, which is 1 or greater, of pin gates and/or film gates are formed at symmetrical positions at both side portions corresponding to the side faces of the obtained light guide plate.

20 8. A process for producing a light guide plate which comprises using the mold described in any one of Claims 1 to 7 and injecting a melted resin material for molding into the cavity portion of the mold.

25 9. The process for producing a light guide plate according to Claim 8, wherein the resin material for molding comprises a resin having an alicyclic structure.

10. The process for producing a light guide plate according to Claim 8, wherein the resin material for molding comprises a methacrylic resin or a (meth)acrylic acid ester-aromatic vinyl compound copolymer.

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